

Shell Model Spectroscopic Factors with Modern Effective Interactions

Spectroscopic factors provide essential spectroscopic information one can use to identify nuclear states and to predict reaction probabilities. In the last 30 years shell model calculations had some successes in describing the fragmentation of single particle strength using effective interactions limited to 0 and 1 $h\omega$ model spaces. I will discuss the new directions in this area of research by considering modern effective interactions, such as those used in the No Core Shell Model, and increasingly complex shell model spaces. I will use as examples the case of the weak proton decay of the neutron rich ^{11}Be halo nucleus, which is under experimental investigation at ISOLDE/CERN, and the $^7\text{Be}(p,\gamma)^8\text{B}$ reaction of astrophysical interest.